In the Claims:

Please cancel claims 5, 9-12 and 20-24, without prejudice; amend claims 1, 6-8 and 13-16; and add new claims 25-50 as follows:

315

1. (Amended) A method of determining spatial target probability comprising the steps of:

acquiring at least two inputs from a location in a desired environment;

applying said inputs to a plurality of model units in a map corresponding to a plurality of locations in said environment;

approximating a posterior probability of a first target at each of said model units based on said at least two inputs;

finding a model unit from said plurality of model units with a highest posterior probability;

choosing a location in said environment corresponding to said model unit with said highest posterior probability as a location of a next target.

Please cancel claim 5 without prejudice.

---

6. (Amended) The method as defined in claim 4, wherein said posterior probability is approximated using a sigmoid curve function.

316

7. (Amended) The method as defined in claim 4, wherein said posterior probability is approximated using a linear function.

applying at least one input associated with said training target to the model neural network to obtain said actual responses of the model neural network to said training target;

generating said desired responses of the model neural network to said training target;

finding differences between said actual and desired responses; and

using back-propagation to reduce said differences between said actual and desired responses.

---

15. (Amended) An apparatus for automatically tracking a target in a desired environment, said system comprising:

at least one first sensor for receiving sensory inputs from the target;

a controller, based on said sensory inputs, for locating the target in the environment using a program modeling a neural network of a brain; and

at least one directional second sensor for turning to a location in the environment where the target has been located by said controller,

wherein said model of said neural network includes a map having a plurality of model units corresponding to a plurality of locations in the environment for receiving information from said sensory inputs associated with the target located in the environment through a plurality of input units and connections between said input units and said model units.

B17

16. (Amended) The apparatus as defined in claim 15 wherein the target is located by approximating a posterior probability of the target given said sensory inputs.

Please cancel claims 20-24 without prejudice.

B18

25. (New) The method as defined in claim 13, wherein the plurality of output units of the model neural network represent model units in a map corresponding to a plurality of locations in said desired environment.

26. (New) The method as defined in claim 14, wherein said step of using back-propagation includes iteratively adjusting weights associated with the hidden units.

27. (New) The method as defined in claim 13, wherein said predetermined inputs and said at least one input associated with said first target are sensory inputs.

28. (New) The method as defined in claim 27, wherein said sensory inputs include audio and video inputs.

29. (New) A method of determining spatial target probability using an unsupervised adaptive algorithm in a model of a neural network, said method comprising the steps of:

organizing a map into a plurality of model units corresponding to a plurality of locations in a desired environment for receiving information from sensory inputs associated with a target located in said environment through a plurality of input units and connections between said input units and said model units;

adjusting said map to increase an amount of said information from said sensory inputs that are transmitted to said map using an unsupervised learning mechanism; and

modulating a strength of said sensory inputs associated with said target based on a correlation between activities of said map and predefined modulation units, and on anti-correlation between said predefined modulation units and said sensory inputs associated with said target.

30. (New) The method as defined in claim 29, wherein a Kohonen mechanism is used in said step of adjusting said map.

31. (New) The method as defined in claim 30 wherein said Kohonen mechanism adjusts weights associated with said connections between said input units and said model units such that each of said model units become specialized for receiving information indicating a predetermined location in said environment.

32. (New) The method as defined in claim 31 wherein said model units further become specialized for receiving a predetermined modality of said sensory inputs associated with said target.

33. (New) The method as defined in claim 32 wherein said modality includes at least audio and video inputs.

34. (New) The method as defined in claim 32 wherein said modulation units are predefined according to a modality of said sensory inputs associated with said target.

35. (New) The method as defined in claim 34 wherein said modulation units modulate said strength of said sensory inputs by multiplying weights associated with said sensory inputs.

36. (New) The method as defined in claim 34 wherein said modality includes at least audio and video inputs.

37. (New) The method as defined in claim 34 wherein at least one of said modulation units predefined by a first modality of said sensory inputs becomes active when said map receives information through at least said first modality from said sensory inputs, said at least one of said modulation units decreases modulation of said sensory inputs having first modality and increases modulation of said sensory inputs having modality other than said first modality.

38. (New) The apparatus as defined in claim 15 wherein said at least one first sensor includes at least one audio and at least one video sensor.

39. (New) The apparatus as defined in claim 38 wherein said sensory inputs are audio and video signals.

40. (New) The apparatus as defined in claim 15 wherein said at least one directional second sensor includes at least one of an audio and a video sensor.

41. (New) The apparatus as defined in claim 15 wherein the target is located by a supervised learning algorithm in which,

said model neural network is trained to reduce an error between an actual response and a desired response of said model neural network to predetermined inputs from a known location in the environment;

sensory inputs associated with the target located in the environment is applied to said plurality of inputs of said model neural network;

the model units with a highest desired value is found; and

a location in the environment corresponding to said model unit with said highest desired value is chosen as a location of a next target.

42. (New) The method as defined in claim 41, wherein said training of said model neural network includes,

positioning a training target at a random location in the predefined environment;

applying sensory inputs associated with said training target to the model neural network to obtain said actual responses of the model neural network to said training target;

generating said desired responses of the model neural network to said training target;

finding differences between said actual and desired responses; and

using back-propagation to reduce said differences between said actual and desired responses.

43. (New) The apparatus as defined in claim 15 wherein the target is located by an unsupervised adaptive algorithm in which,

said map is adjusted using a Kohonen mechanism to increase an amount of information from said sensory inputs that are transmitted to said map; and

a strength of said sensory inputs associated with the target is modulated based on a correlation between activities of said map and predefined modulation units, and on anti-correlation between said predefined modulation units and said sensory inputs associated with said target.

44. (New) The apparatus as defined in claim 43 wherein said Kohonen mechanism adjusts weights associated with said connections between said input units and

said model units such that each of said model units become specialized for receiving information indicating a predetermined location in said environment.

45. (New) The apparatus as defined in claim 44 wherein said model units further become specialized for receiving a predetermined modality of said sensory inputs associated with said target.

46. (New) The apparatus as defined in claim 45 wherein said modality includes at least audio and video inputs.

47. (New) The apparatus as defined in claim 45 wherein said modulation units are predefined according to a modality of said sensory inputs associated with said target.

48. (New) The apparatus as defined in claim 47 wherein said modulation units modulate said strength of said sensory inputs by multiplying weights associated with said sensory inputs.

49. (New) The apparatus as defined in claim 47 wherein said modality includes at least audio and video inputs.

Conc'd B18

50. (New) The apparatus as defined in claim 47 wherein at least one of said modulation units predefined by a first modality of said sensory inputs becomes active when said map receives information through at least said first modality from said sensory inputs, said at least one of said modulation units decreases modulation of said sensory inputs having first modality and increases modulation of said sensory inputs having modality other than said first modality.